Hornby Island
Groundwater Protection Pilot Project
Phase II Report

A Partnership Between Islands Trust
and
the Ministry of Water, Land, & Air Protection

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***Provincial government agencies whose names have changed since the spring 2001 election will be referred to by their new name unless noted otherwise.

Ministry of Environment, Lands & Parks (MELP)
Ministry of Water, Land & Air Protection (MWLAP)

Ministry of Municipal Affairs and Seniors Housing (MMASH)
Ministry of Community, Aboriginal & Women's Services(MCAWS)

The Hornby Island Groundwater Protection Pilot Project -- Phase II

I) Introduction

This report summarizes the Phase II process of the Hornby Island Groundwater Protection Pilot Project. The project is administered jointly by Islands Trust and the Ministry of Water, Land & Air Protection. As stated in the Phase I Report the purpose of this pilot project is to develop a groundwater protection program that is to be tentatively implemented throughout the Trust Area (refer to Phase I Report). In addition, knowledge gained from this process and elements of its outcome could be put toward a provincial regulatory framework. Hornby Island, like many communities in the Province of British Columbia, has been experiencing groundwater quality and quantity issues for some time. The island is not well prepared for any future growth that may take place.

The main purpose of Phase II of the project was:

1. To put together a strategy for groundwater protection based on the wishes of the community and the unique requirements of an island environment while fitting within the framework of existing government regulations.

2. That concerns addressed by the Strategy, are to be reflected in the Hornby Island Official Community Plan (OCP) with the ultimate objective of establishing relevant land-use planning policies.

3. To set a draft terms of reference for Phase III.

This report is organized chronologically by the tasks and initiatives the Advisory Groundwater Protection Committee (AGPC) undertook except where there are related initiatives with a time gap. The following is a timeline-overview:

Appointment of Committee	December 1999
Mandate/Goals	February 2000
Agencies/Partners Meeting	April 13, 2000
Royal Roads University Project	January – August 2000
Diana Allen (fieldwork, report)	May 2000 – January 2001
Public Groundwater Meeting	December 12, 2000
Hydrogeological Presentation	February 15, 2001 (Dr. Diana Allen)
OCP Review -- Draft I	February to June 2001
GW Forum Meetings	April – June 2001
Groundwater Protection Strategy	June – August 2001

In addition, projects and initiatives not undertaken by the committee, but which occurred concurrently and are likely to have impact on groundwater issues on the island are briefly outlined near the end of this report. They are ordered by their immediate relevance to the island first and then the dates they came to the attention of the AGPC. They are as follows:

MWLAP Aquifer Classification	completed in August 2001
New Draft Sewage Regulations	October 2000 (still in progress)

Drinking Water Review Panel	February 2001
Mount Geoffrey Crown Land and Islands Trust Public Lands Strategy	October 2000
BC Hydro's Wood Pole Maintenance Program	February 2000

II) Phase II Process

A) Appointment of Advisory Groundwater Protection Committee

In December 1999, the Advisory Groundwater Protection Committee was formed at the initiative of the Hornby Island Local Trust Committee of Islands Trust. This was based, in part, on the Community's input in Phase I to "establish a Hornby Island Groundwater Protection Management Committee" that is not a regulatory body, but would be a locally-based entity that would facilitate a comprehensive, integrated approach toward the resolution of some of the water quantity and quality issues on the island. It was set up as an advisory committee rather than a 'management' committee largely due to limited resources as well as hesitation about use of the term 'management'. The term 'management' implied some type of control over rather than evolution from the community.

There are a number of groups and individuals that are committed to groundwater protection in various ways (as outlined in Phase I report, see Appendix A). There was concern about the potential overlapping of initiatives. As a result it took some time to sort out how this new committee would fit in. It was determined that the role of the committee was one of co-ordination and support of other related committees and individuals and their endeavors. Members of the committee also wanted to be very clear that this is an 'island' committee representing the island to Islands Trust and other agencies, not the other way around.

Establishment of the AGPC also addressed a key concern of supporting agencies relating particularly to funding and that is community cohesion behind the Project. Various Partners had been individually submitting proposals and applying for funding (including the Advisory Committee) raising the question from the agencies as to what degree of communication was taking place, if any. The agencies would look more favourably on providing funding if it could be demonstrated that:

a) The community unanimously supports specific projects and
b) Work of each of the Partners was complementary, or in other words, there is no duplication of efforts or funds, or working at cross-purposes.

The AGPC Committee can certainly be the node from which this communication takes place and play a facilitating role in the community.

B) Advisory Groundwater Protection Committee & Goals

The AGPC was a consortium of representatives from various groups and individuals who have been working for some time on groundwater protection and wastewater treatment issues on the island as well as other interested members of the community (Appendix B). It was formed to act as a co-ordinating body to augment and support this work and to act as a liaison between the community, local government and off-island agencies. Once the role of the AGPC was determined and a chairperson selected, members set out to establish the following goals:

- To develop a program to minimize the adverse impacts of land use and liquid waste disposal on groundwater quality.
- Advise the Hornby Island Local Trust Committee on issues relating to Groundwater Protection.
- Projects advising, co-ordination and liaison (subject to funding availability):
    - Alternative On-Site Treatment Options/Regulations
    - Hydrogeological Study
    - Inventory for a Hornby Island Groundwater Management Plan
- Community and visitor education on waste disposal and water conservation.
- Encourage community and visitor participation/feedback.
- Research funding bodies for technical and financial support programs.
- Set the Terms of Reference for an ongoing, permanent Groundwater Protection Committee.

C) Phase II Funding

There were a number of government sources for funding of the Phase II process (Appendix C). Islands Trust contributed $10,000 from their Official Community Plan budget to the hydrogeological study by Dr. Diana Allen from Simon Fraser University, including $5,000 from the Ministry of Water, Land and Air Protection. The Ministry of Community, Aboriginal & Women's Services (MCAWS) (Ministry of Municipal Affairs & Housing at the time), contributed a total of $12,500 from their Infrastructure Planning Grants of which $7,500 went to the Hornby Island Hydrogeological Study and $6,250 to the Alternative Sewage Treatment options Study by Royal Roads University students (see section E. i). The latter was handled through the Regional District Comox-Strathcona (RDCS) since those types of funds must be administered by a local or municipal government agency. The Ministry of Water, Land and Air Protection (MWLAP) (Ministry of Environment, Lands & Parks at the time) granted Islands Trust $3000 to hire a Co-ordinator for the AGPC. Water Stewardship applied to the Grant-in-Aid program and received funds of $1000; half to pay the Coordinator, and the remaining half to be divided between a student liaison to assist with the hydrogeological study and administrative expenses of the AGPC.

MCAWS and the RDCS experienced some confusion as one of the Partners had

requested grant information on behalf of the committee prior to its appointment. This required the committee to become clear about the different projects, how they fit together and their significance to Phase II. A letter to this effect was sent to the ministry. Another project had also been applied for - *An Inventory for a Hornby Island Groundwater Management Plan* ($7,500). It was agreed, however, by both MCAWS and the AGPC that it would be better to carry out such an inventory at a later date as three projects may be too many at once (see Section E – Projects and Goals for project information).

D) Advisory Groundwater Protection Committee & Off-Island Agencies Meeting

This meeting was held April 13, 2000 with the purpose of introducing the local Partners and representatives of the off-island agencies to one another and determining how each could contribute to the Project. The Phase I report outlined briefly how individual government agencies may be helpful to us and at the meeting this was reinforced and more details were provided. Below is a brief outline of these. Due to the nature of this project it is necessary for us to have access where possible to off-island agencies for advice and support. In turn we can give our input based on what we glean from this process to agencies to include in their formulation of future provincial regulations relating to groundwater protection. Appendix D is a listing of those agencies whose representatives were invited, attendees and regrets.

Prior to the Agencies and On-Island Partners meeting, the AGPC formulated a list of questions for the agency representatives to guide the meeting (Appendix E). There were some common responses amongst the representatives. It was made clear they want to work together with the Hornby Island Community towards resolving groundwater and sewage treatment problems on the island. The starting point for accomplishing this is to maintain confidentiality on the results of any data or other information collected including not taking punitive action where a system is inadequate. It was also stated that the information learned from the Pilot Project
could be used for other areas in the province with similar conditions and problems. Below is a brief outline of services each agency would be able to offer.

i. Ministry of Community, Aboriginal & Women's Services - Engineering Services

Provide the opportunity to apply for Capital Works Grants, Local Green Economy and Local Initiatives Funding. These must be applied through a local government, such as the Regional District (RDCS) (Islands Trust in this case does not apply as they are strictly a land use planning agency, and do not provide infrastructure services, such as water, sewage, etc.). To be considered for a grant, the applicant must be part of a Local Service Area. This can be as little as two homes or as much as hundreds. There is a process involved in becoming a Local Service Area usually by referendum and must be arranged, as in our case, through the RDCS.

In addition, many of these grants are designated specifically for the infrastructure itself and not planning. These grants could potentially be helpful in the materials acquisition and construction stage of the process. More detailed research would be needed into these sources of funds as well as others. MCAWS might also be able to advise in the search for other such funds.

ii. Ministry of Water, Land and Air Protection - Groundwater Section

The Ministry of Water Land and Air Protection would be able to provide advice on groundwater protection planning as well as technical support such as mapping (including data from their geographic information system) and general hydrogeologic surveys. MWLAP has some educational materials available about the technical aspects of groundwater such as a Plexiglas model of a typical cross-section showing groundwater flow, for example, as well as a number of brochures and videos. The videos also discuss the importance of sealing wells and how faulty septic systems contribute to groundwater degradation.

In addition, MWLAP has a digital map and database of over 650 registered wells for Hornby Island. The database can be accessed on the Internet at wlapwww.gov.bc.ca/wat/waterbot/gwell-out.html. Since well records are submitted voluntarily, the database may not include all wells on the island.

The Ministry has also produced a series of documents called the Well Protection Tool Kit. These provide step-by-step information on how a community can go about protecting wellhead areas. This is largely a planning tool covering subjects from the formation of a committee to coordinate the process, hiring contractors (when possible) to carry out studies to delineate capture zones, for example, to the implementation of protective measures and finally monitoring and maintenance.

While this 'tool kit' has many useful suggestions the AGPC had already undertaken, such as forming a committee, the information is geared mainly toward communities with water systems that may have more resources at hand. Many such committees may be organized through a municipality or regional district with one or two paid staff members (who in some cases may be volunteering some of their time) and others on the committee who are otherwise employed. On Hornby Island, and presumably other Gulf Islands too, many residents of 'working age' often have at least more than one occupation to survive and may be too busy to dedicate the volunteer time which can be intensive with an undertaking of this type. Those of 'retirement age' do not necessarily, and understandably, want to work at the intensity that is sometime required. At least one consultant must be hired to maintain momentum and continuity. Volunteers often have other commitments and have limited time to offer.

MWLAP also stated they would be willing to carry out an Aquifer Classification study for Hornby Island as they were for other areas in the province. This was carried out in August 2001 (see K. Hornby Island Aquifer Classification, p. 15). The purpose of the classification was to create a broad

picture of the current status of the province's aquifers relating to the degree of development on the land surface and the level of their vulnerability to contamination. This could help prioritize areas on Hornby Island requiring immediate attention.

iii. **Ministry of Health - Upper Island Central Coast Community Health Care Services Society (UICCCHCSS) - Environmental Health (Courtenay)**

The role of Environmental Health is in part to promote and enforce current provincial legislation relating to water and wastewater issues. The Ministry of Health sets the regulations for sewage systems with less than 20,000 litres (5000 gallons) per day (22.7 cubic metres per day). MWLAP is responsible for flows above this). Environmental Health would be able to assist with monitoring of wells and sewage treatment systems that would, for example, be part of an approved pilot project, such as they did with the wetland constructed and administered by GHOSTS. It was understood and agreed that confidentiality of results relating to properties of individual homeowners was of utmost importance in the success of this pilot project. Environmental Health would like to maintain dialogue with the islands, and Hornby Island in particular, in this case.

iv. **Regional District Comox-Strathcona**

In addition to its role as an intermediary of funding between MCAWS and a co-ordinating committee on Hornby Island as mentioned earlier, it could be more directly involved in other ways. The Regional District is able to provide technical support such as mapping and access to any data that we may require. It could provide assistance with setting up a Liquid Waste Management Plan (LWMP) if the community wished this through a referendum* (A referendum was held several years ago in the Comox Valley including Hornby and Denman Islands, however, Comox Valley residents voted against a LWMP). It could also assist with establishing one or more Local Service Areas on the island where desired. This would help with funding of capital projects servicing more than one parcel, as the Regional District is not able to support funding for individual property owners. They could directly assist with infrastructure financing, as they are able to get better interest rates than a local organization could.

In addition, the Regional District could take on the operation and maintenance of approved systems or administer the contracts to do this work, or some combination thereof. Systems include those for both water distribution and related aspects such as water purification, for example, and sewage treatment and/or removal to Vancouver Island. The RDCS would take on this work if the community would be prepared to accept an increase in taxes. Alternatively, if the Regional District were to take on the administration rather than the actual work this could potentially provide employment for local, certified contractors.

Since sewage treatment has serious health and environmental consequences the issue of liability is great. An organization must have sufficient resources to take on this responsibility. The Regional District is the nearest to 'local' at

present in whose mandate it is possible to do this. It is currently not in the mandate of Islands Trust, though they may consider it in the future.

v. **Islands Trust**

Islands Trust would provide land use planning relating to groundwater protection, as is generally stated in its mandate. It would also act in an advisory and advocacy capacity on behalf of the residents of Hornby Island to other government agencies. Zoning and bylaws could be set up to accommodate various models of groundwater protection from recharge areas, to water distribution/catchment infrastructure and used-water recycling and treatment, for example. These depend on community approval and alignment with current government regulations, and will be a long term 'building' process.

E) Projects & Goals

i. Royal Roads University - Water Stewardship and Wastewater Management On Hornby Island

The purpose of this joint project between Water Stewardship and students from Royal Roads University (RRU) was to document the status of water quality and waste disposal in specific representative subdivision areas, and to investigate innovative sewage treatment technologies suitable for conditions on Hornby Island and the regulatory framework that could accommodate these. The project is a compilation of current literature and analysis of the following:

- physiographic and environmental conditions on the island, such as soils, climate and hydrology (including a summary of well distribution)
- water quality a)distribution of coliform counts in wells around the island and b)nutrients loading such as nitrogen and phosphorus (at the time of their report this has not been surveyed), and other chemistry such as hydrogen sulphide gas and iron, for example.
- applicable existing provincial legislation relating to groundwater protection and sewage treatment and how these could apply to Hornby Island and other Gulf Islands.
- Inadequacies of current regulations.
- approved conventional septic treatment and innovative sewage treatment technologies that would be suitable for conditions on Hornby Island.

As a part of their project the RRU students together with the assistance of Water Stewardship designed and conducted a survey of existing sewage treatment on Hornby Island. An informal meeting was held in March 2000 with the four students, their instructor, members of the AGPC, interested members of the community, and the Hornby Island Trustees. The project was carried out over two weekends in May and June 2000 and the report was received by Water Stewardship the following September. To start with, the AGPC was going to recruit the volunteers whom they did through an information and sign-up sheet, but as the project design was being refined it

was decided that another approach was needed. The RRU Project team selected two unidentifiable residential areas on the island and then contacted the property owners within each area requesting their permission to participate in the survey (see the Questionnaire in Appendix 2 in the report *Water Stewardship and Wastewater Management on Hornby Island*). Given the sensitive nature of the subject, the survey would be akin to a rudimentary level inventory. However it did provide much needed, first-time documentation of the current sewage treatment and water quality-quantity conditions, based on residents' observations of some areas of the island.

ii. Simon Fraser University - Groundwater Geochemistry Study on Hornby Island

Dr. Diana Allen and two of her students, Honours Student Greg Matsuo and Quinn Jordan-Knox, and a University of Victoria student, Karen Brelsford, carried out a hydrogeological study of Hornby Island using groundwater geochemistry in May 2000 over a ten-day period. The purpose was to delineate groundwater flow regimes, recharge and discharge areas, chemical characteristics of the water and groundwater evolution in the different flow zones. The general conclusions of this investigation were that:

- much of the island is a recharge zone mainly occurring on Mt. Geoffrey and other areas of relative high elevation
- the groundwater originates on the island itself and does not come from Vancouver Island or other off-island areas as had been suggested in the past
- much of the water flow is through fractured bedrock, sandstone, mudstone and conglomerate and thus, facilitating potential contamination transport
- saltwater intrusion is a concern in the Whaling Station Bay area
- there were no significant levels of toxic metals present in the areas that were tested
- another important benefit of this study is that it provides a base from which other geochemical surveys could be carried out to see what, if any, changes have occurred over time and to what degree.

From a groundwater protection and land use planning view these conclusions indicate that parcel density, particularly well density, depth of wells and the nature of land use (zoning) must be strategically managed. Public education and encouragement of 'best practices' are also vital. Our water is simply a product of what we do on the ground above it, there is no other.

Islands Trust and MWLAP granted matching funds that allowed the testing of 130 water samples, and transportation and accommodations for Dr. Allen and her students. About 120 of samples came from private properties with wells, a few from commercial and institutional locations such as the Hornby Island Co-op and the Doris Savoie Clinic, some from open streams and water bodies, and one or two ocean samples. Dr. Allen and the students collected the samples themselves to ensure a consistent sampling procedure and that no contamination would occur.

The AGPC co-ordinated the logistics of well availability ahead of time aiding a

relatively smooth and efficient sample collection process. Volunteers, wishing to have their wells tested, were recruited by means of an information sheet with a sign-up portion attached (see Appendix F for an example). The sheet accomplished a number of objectives: it explained the nature of the two projects to the homeowner; the property owners' addresses could be used to plot a map; their signatures provided written permission to have the SFU team come onto their properties; and, of course, contact information. There were also two or three Saturdays on the Co-op porch where AGPC members could chat with passers by about the projects and get interested parties to sign up. It was made clear that if there were more volunteers than the allowed-for samples not all volunteers may get their wells tested. The signatures were then collected from the designated drop-off box inside the Co-op and volunteers called to confirm the availability of their well and to let them know as best as possible the day the testing may be done on their property.

The response rate was very successful; about 176 wells were volunteered. All the responses were plotted on a map to show distribution. In cases where there were clusters of wells close together Dr. Allen chose one. In some cases where the homeowner was not home, and an outside tap could not readily be found, another nearby well was chosen. Members of the AGPC tried to call as many volunteers as possible to let them know when Dr. Allen might be coming to sample their wells, but as it turned out, it was impossible to estimate timing as decisions were made in the field.

The success of acquiring so many volunteers could be attributed to the earlier well testing carried out by Water Stewardship and the confidence its members had built up in the community. The opportunity of have one's well tested at no charge was in all likelihood also helpful. The cost of each water sample was at the time about $100. The results of each well tested were sent to the respective homeowner along with a letter from Dr. Allen and a Canadian Drinking Water Guidelines sheet. All results were mailed out in the autumn. Copies of the results were compiled in a binder in the Water Stewardship collection of reading materials.

a. Hydrogoelogical Study - Presentation

Dr. Allen gave a presentation of the results of the hydrogeological study in mid February 2001, just after the draft report was completed. This forthcoming event was alluded to from the beginning of the project and was advertised just prior in local papers and weeklies, as well as posted signs. Approximately 80 - 90 people attended the lunchtime-early afternoon presentation. This was part of a Literary Lunch series of lectures on various topics of interest taking place during the winter months on Hornby Island. A local retired chemist was on hand to help clarify any questions people might have, especially the water chemistry relating to the Canadian Drinking Water Guidelines and health issues. One of the main concerns that had been brought forth is the presence of naturally occurring manganese in the soil and how it could possibly be related to health issues, such as Parkinson's disease. Dr. Allen assured those concerned that there were no significant amounts of manganese in

the water that could be deemed as a health risk at the time of the study in the areas that were sampled.

Dr. Allen presented the island with a beautiful, large and colourful map summarizing the information in the hydrogeological report. The map is currently on view in the Hornby Island Community Hall foyer.

iii. An Inventory for a Hornby Island Groundwater Management Plan

A local private consultant proposed an inventory for a groundwater management plan for Hornby Island. This project did not received funding largely because of the other projects that were already imminent at the time of application. The volunteer resources on the island would have also been considerably stretched with an additional project. A detailed technical survey, however, would be a valid project as it would provide a quantitative assessment of the current sewage treatment situation on the island and would assist in identifying areas of priority. Innovative technologies could perhaps be applied and rigorously tested. Funding agencies would look favourably on specific projects that demonstrate a documented need for remediation and a clear plan of what the latter would be.

F) Public Groundwater Meeting

After the loose ends of the Royal Roads and Simon Fraser University projects were completed a public meeting was planned for and held on December 12, 2000. Its purpose was to start looking ahead at Phase III of the Groundwater Protection Pilot Project by bringing the on-island Partners together to update one another and the community, and to generate interest in increasing public participation in the AGPC (see the Agenda in Appendix G). Approximately 23 people attended the meeting. There were representatives from GHOSTS, Water Stewardship, Conservancy Hornby Island (CHI) and the Forest Management Society (FMS), interested community members and Hornby Island Trustees. The organizations dealing directly with water-related issues each talked about their projects and initiatives. The following are some highlights:

AGPC

- Gave an update on committee work and projects to date, and the SFU (Dr. Allen) hydrogeological study.
- Laterin the meeting a discussion was initiated on the direction the Phase II process should take.

Water Stewardship

- Proposal for a central composting facility on Hornby Island. This is a project GHOSTS and WS thus far have discussed. Materials from on-site composting toilets would be further composted at this facility to standards approved by MoH (though Ministry of Agriculture sets the regulations for composted materials). This is proposed as a pilot project that would phase itself out as information and standards are passed on to the homeowner. Management conditions for onsite inspections and monitoring would have to be set up to maintain health standards.
- Reported on Royal Roads project

GHOSTS

- Have collected two years worth of data from the Constructed Wetland at Tribune Bay. MELP and MoH were happy with the results and thus, have permission to build 3 more wetlands in the Comox Valley. Funding is available from the Innovative Technology Program at the University of British Columbia.
- Have completed modification of design of existing greywater treatment systems and three new planter beds have been approved. The Vancouver Foundation and the Regional District are providing funding.

- Technical details and suitable vegetative materials for treatment were briefly discussed

Ron McMurtrie

- Is involved in a province-wide public awareness program on the operation and management of on-site waste disposal systems. He and Giff La Rose are working with regional districts and municipal agencies in giving presentations in various locations around the province. This program is sponsored by the Ministry of Health.

Tony Law, Hornby Island Trustee

- Gave an update on the status of the Official Community Plan Draft I, the review process in general and the role of Phase II in that process.

The meeting facilitated in the addition of four new participants in the AGPC.

G) Community and Visitor Education

Keeping the community informed and updated was accomplished in a number of ways. There were approximately 4 to 5 'Co-op Porch' events. These were informal sessions on the Co-op deck with a large painted display courtesy of the Hornby Island Water Stewardship Project and an information table with pamphlets and brochures about groundwater and water conservation. Some of these sessions were related to the studies mentioned earlier. Committee members sat the table in shifts and actively engaged shoppers passing by. Many would often stop and chat of their own accord with questions about water or sewage whether they lived on the island or not.

Articles were written for a local monthly paper that many off-islanders, particularly part-time residents, subscribe to. The articles provided updates as well as information about groundwater. The Denman-Hornby Grapevine, a weekly community paper distributed to both islands, had information and notices submitted within the paper itself or as inserts. Near the end of the Phase II process, an article was published in the Georgia Strait Alliance newsletter informing its members of the Pilot Project and the proposed strategy for Hornby Island.

H) Official Community Plan (OCP) Review – Draft I

The Official Community Plan sets guidelines and policies for future land use patterns on Hornby Island based on Community wishes and values, provincial legislation and policies established by various levels of government. The Hornby Island OCP review process began in 1998 with the first draft ready in January 1991, followed by four months of bi-monthly community meetings with additional meetings as needed. Islanders were encouraged to participate in discussion and provide feedback as much as possible. Each meeting focused on one or more sections of the OCP document including Groundwater Recharge and Community Services of which Water Services and Disposal of Sewage are part. Naturally, water supply and sewage issues came up in many parts of the OCP outside of their designated sections.

The AGPC worked intensively over this period of the OCP Draft I document on all aspects relating to groundwater protection and made recommendations for changes. Some highlights are:

- Creation of Groundwater Protection Areas (GPA) rather than 'watershed reserves' or 'groundwater recharge areas' such as the forested upland area, which includes Mt. Geoffrey Regional Park and the undeveloped crown land parcel. The term 'GPA' is stronger and right to the point. Areas around well heads should be protected and are included in the concept of a GPA. A GPA should be established on the foundation of hydrogeological studies of the area. Likewise taking an area out of a GPA should be done on the same basis.
- Hydrogeological studies of potential GPAs should be completed on a priority basis. Prioritization could be facilitated by selecting wells of particular concern and determining the degree of use, proposed developments that could adversely impact groundwater quality and quantity, and results of water quality tests that indicate water quality degradation.
- Areas of public use: the community works with appropriate provincial ministries to identify to best use with the overriding principle that groundwater be protected.
- Protection and monitoring of the Sollans Road Community Well and the Whaling Station Bay Improvement District well and associated subsurface water collection system. Activities in these areas should not compromise the quality or amount of water in the wells.
- The gravel pit requires groundwater protection and limit of activities in the area due to its proximity to the Sollans Road Community Well and its uphill location from a major subdivision.
- Agricultural practices should not pollute the groundwater. Agricultural waste must not be directly discharged into a watercourse or groundwater nor should it be applied to the land if environmental conditions (weather, topographical or soil) or rate of application can cause contamination of a watercourse or groundwater.
- The concept of small-scale campgrounds on agricultural land requires further discussion. Human contamination of groundwater and compromise of recharge capabilities caused by potential fires, a high

summer hazard, are of significant concern.

- Areas where subdivision or changes in zoning can occur proof must be supplied by the applicant of adequate water supply and approved sewage treatment.
- Water catchment and storage, and recycling of water are strongly encouraged as means of water conservation practices.
- Ministries will be requested to support research, development and application through pilot projects of alternative wastewater treatment systems
- Hornby Island and surrounding seas are "no dump" zones.
- The use of herbicides and pesticides on private and public lands are prohibited.

In late February 2002 the second draft of the OCP was completed and the above highlights and more detailed related elements were incorporated. However, rather than having similar water-related objectives and policies repeated excessively throughout the document the subject of groundwater protection appears in groupings ranging from general background information to broad community objectives to specific objectives and policies and finally appear in relevant areas of environment, resources, infrastructure, and sustainable development including residential, agriculture, commercial, recreation, marine and development permit areas.

I) Groundwater Protection Forum Meetings

There were three Groundwater Protection Forum meetings, as they came to be known, in April, May and June 2001(see Appendix H). These were much the same as the on-island Partners meetings that were held earlier in the Phase II process and had 15 to 20 participants. The latter evidence that this committee be instrumental in bringing the Partners together and communicating was particularly encouraging. The main purpose of these meetings, unlike the earlier meetings, were to decide how to best use the remaining funds left over from the Royal Roads University study of approximately $5000 still held by the Regional District. While this, no doubt, also enticed the Partners to the table; there was a sense that this Pilot Project is becoming more 'real'. Each organization or group put forth informal proposals on how they thought the money could be used. However, no conclusion was reached. Originally, only one meeting was planned with a representative from the Regional District but due to other commitments he was unable to attend. Island Partners decided to continue the meeting regardless This provided the opportunity for each to give updates on the project(s) their group or they individually were working on, as well as overall discussion of the process and its direction. These discussions were instrumental to the AGPC in finalizing a Draft Strategy for groundwater protection on Hornby Island.

J) Hornby Island Groundwater Protection Strategy

The Hornby Island Groundwater Protection Strategy was drafted by the AGPC

and modified following discussions with the Forum, with the assistance of the Committee members. This was started in April 2001 and the latest draft completed the following August. The Strategy was based on a) recommendations in the Water Stewardship Project Report (September 1999), b) input from people attending groundwater related meetings, "porch" sessions at the Co-op store, c) many comments made by islanders at OCP Draft I Review meetings. It is a 'living' document that could be added to or otherwise modified over time. Strategy highlights are outlined below (see Appendix I for details):

- protection of wetlands on public and private property
- preserve and enhance groundwater recharge quantities (awareness of land use practices, e.g. clearing, ditching, etc.)
- increase water conservation awareness and practice
- enable approval of greywater treatment and dispersal
- assess feasibility of a central composting facility
- assist and expand use of composting toilets
- assess desire and feasibility of centralized wastewater treatment in subdivisions
- promote proper wastewater treatment
- reduce and progressively eliminate groundwater pollution caused by failing septic systems
- reduce and progressively eliminate groundwater pollution resulting contaminated water entering wells or around well casings
- prevent aquifer contamination resulting from abandoned wells
- protect aquifers from poorly constructed wells
- prevent pollution of aquifers caused by household and land use activities (herbicides, pesticides, cleaners, petroleum products, etc.)
- protect aquifers from pollution caused by inappropriate agricultural practices
- create program to measure effectiveness of this Strategy

General Goals and Objectives:

- Development and maintenance of data and information systems related to liquid waste disposal and water conservation.
- Development and implementation of an ongoing public education and awareness program relating to waste disposal and water conservation.
- Application of a land use planning process having an appropriate technical foundation.
- Application of approval and regulatory systems, which will reduce the adverse impacts of a) land use and b) liquid waste disposal.
- Development and fostering of technical and financial support programs.
- Implementation of an effectiveness evaluation process covering all aspects of the Program.

K) Hornby Island Aquifer Classification

The Ministry of Water, Land and Air Protection has carried out a province-wide aquifer classification project over the past few years. The purpose was to rank aquifers according to their degree of development and vulnerability to

contamination. A generalized aquifer classification study of Hornby Island was carried out by MWLAP late in August 2001. It was based largely on well log information, geology reports and existing research of groundwater conditions on the island. It was determined that while much of the island is lightly to moderately developed, with the exception of St. Johns Point peninsula on the eastern side which is considered heavily developed, all of Hornby Island is highly vulnerable to contamination. St. Johns Point ranks with Belcarra (Lower Mainland) as one of the only two areas of British Columbia that have the highest ranking in both the level of development and vulnerability, thus giving them highest priority for groundwater protection measures and management. Approximately 438 aquifers have been identified in the province to date. (www.gov.bc.ca/wat/aquifers/index.htmi)

III) Initiatives Concurrent With the Phase II Pilot Project

A number of initiatives were occurring concurrently with, but were not directly part of the Phase II Pilot Project. They do however, have implications for groundwater protection on Hornby Island as well as elsewher e in the province.

A) New Draft Sewage Regulations

The Ministry of Health released the latest Draft Sewage Regulations (Draft 4) in October 2000. They differ from the sewage regulations established in 1985 in that they go beyond setting the specifications for septic treatment systems only, such as the dimensions of the septic tank and setbacks, for example. They provide guidelines for the system to function effectively taking into consideration existing environmental information for the site. For example, the effluent loading rate should be a maximum amount for a given soil type and percolation rate. The regulations also state the requirement to submit site investigation tests and technical reports completed by professional specialists such as hydrogeologists or soil scientists, for example, if a health officer requests it. So, in other words, the regulations are more performance rather than system-specification based. This is a significant step toward allowing the use of other types of sewage treatment systems, which has tremendous implications for Hornby Island and other rural areas in the province.

B) Source Water and Drinking Water Protection

The Drinking Water Review Panel (DWRP) appointed by the Ministry of Health Services and the Ministry of Water, Land and Air Protection, published a document, Source Water and Drinking Water Protection (Draft), in January 2001 and produced a final version in February 2002. The report provides recommendations on the completeness, effectiveness and efficiency of the Drinking Water Act passed in April 2001. The DWRP document discusses water protection in relationship to land use planning, on-site wastewater treatment and the Draft Sewage Regulations. Many of the objectives outlined in the report are similar in principle to the ones contained in the Hornby Island OCP and the Groundwater Protection Strategy. The following are highlights of some of the

objectives:

- Creation of a single Drinking Water Protection Agency that reports directly to the Ministry of Health Planning.
- Strengthening of drinking water source protection measures.
- Province-wide screening of risk assessments of water systems to identify and prioritize critical drinking water supply areas.
- Creation of a dedicated drinking water protection surcharge applying to a range of user fees (this may not be applicable or desirable to the Hornby Island community).
- Development of a comprehensive infrastructure funding program.

It would seem that the efforts of concerned citizens around the province, who have been working hard for groundwater protection in their communities, are being heard.
This is a significant step forward in the long road ahead. The report thanked the Panel members for their efforts in gathering information for the report. Volunteers - individuals and organizations - who are the front-line in their communities must also be acknowledged.

C) Mount Geoffrey Crown Land and Islands Trust Public Lands Strategy

The purpose of the Public Lands Strategy was to develop a technical classification system for Crown land within the Islands Trust area. This process began midway through Phase II of the Groundwater Protection Pilot Project in the late autumn of 2000. At the time the provincial government was looking to see which of its Crown lands could be sold. Large Crown land parcels with sale potential were particularly vulnerable, such as the Mt. Geoffrey Crown land parcel of nearly 400 hectare (1000 acres) on Hornby Island. This large piece of land is part of a significant area for groundwater recharge for the island and its possible development could have major impacts on the groundwater supply. By classifying Crown lands in the Trust area according to land capability, suitability and interest into categories of resource management, conservation and settlement the Trust could prioritize parcels based on a rating system.

Many in the Hornby Island community made it very clear that the Mt. Geoffrey Crown land should be a conservation zone for its unique plant and animal life, and groundwater recharge capabilities. Others would like to use it as a woodlot which is what it was once zoned as (as well as being zoned as a Watershed Reserve), with locally controlled selective logging being permitted. Others would like to see mixed uses for the land combining conservation, forest, trails and recreation. Hornby Island Residents and Ratepayers sponsored a detailed ecosystem inventory of this parcel, Upland Crown Land Study, which in addition to carrying out an inventory and detailed mapping, possible uses and tenure options were outlined and discussed. These uses were a compilation of community opinion over the years and include: water, forest (including old growth), ecosystem, trails and recreation where Currently, MELP has a Notation of Interest on the land in perpetuity that periodically comes up for review (the last review was slated for December 31,1999). Presumably the Notation of Interest still continues. There is ongoing debate about the best uses for this parcel.

However, most agree in general that it is a significant groundwater recharge area and this has been supported by a number of professional opinions (see References).

D) BC Hydro's Wood Pole Maintenance Program

In November 1999 BC Hydro initiated a renewal of its pesticide use permit with MELP for a two-year, province-wide wood pole treatment program, including Hornby Island and other Gulf Islands. The preservatives that were to be used included chemicals such as copper napthanate, boron (borax), sodium flouride, metam sodium (sodium methyldithiocar-bamte) and anhydrous disodium octoberate. They were to be applied, by MELP certified pesticide applicators, employing a variety of methods singularly or in different combinations on different poles depending on the treatment required.

Residents of Galiano Island initially expressed concerns about the environmental effects of the pesticides. A meeting was held on Galiano Island with residents, Islands Trust Trustees and BC Hydro to discuss treatments and answer questions. The main concern was the leaching of these chemicals out of the poles over time into the soil and eventually into the groundwater. Studies completed on these substances indicate that many degrade over enough time to render their presence ecologically insignificant. However not all, or their method of application, have been studied thoroughly. In addition, some of the preservatives would be used in such small amounts as to also have little environmental effects. Problems would occur, however, if there were accidental spillage or treatment of poles within 30 metres (100 feet) of wells, or within 1 metre (3 feet) of standing water (Dr. John Sprague). Dr. Sprague, an environmental toxicologist on Salt Spring Island, was unsatisfied with the 1 metre limit if the definition of standing water included ponds or marshy areas and requested more information. At a later meeting on Galiano Island BC Hydro was asked to use the least toxic treatment, such as the boron, and that areas to remain pesticide-free must be clearly defined. Pesticide applicators could be given maps showing locations of wells, water bodies of all types and other pesticide-free zones.

Hornby Island Trustees asked the AGPC if residents of Hornby Island should adopt a similar position and if they had other input. Members of the AGPC agreed the least toxic option was best, etc., but had not much else to suggest at the time due to time constraints with grant application deadlines and committee business. The Trustees stated they would bring issue of wood pole treatments to the next Trust council meeting (in spring or early fall 2000) to set a protocol for the Island Trust Area as a whole rather than each island separately.

IV) Conclusion

Despite some initial fits and starts for the Advisory Groundwater Protection Committee, a great deal was achieved by a very dedicated group of volunteers. The committee met most of its objectives and goals, many of which originated from community input during Phase I, in a timeframe of nearly two years. The AGPC was

originally appointed to exist for about one year, however, it required several months to determine its exact role given other related organizations on the island as well as sorting through several grant applications and the need to clarify projects early on a very short space of time. In addition, there was a great deal of enthusiasm to do as much as possible to get to a point where the implementation process can begin and the goal of groundwater protection to be realized.

The various studies; the hydrogeological study by Dr. Allen, the investigation into alternative sewage treatment options by the Royal Roads University students, and the Aquifer Classification by the Ministry of Water, Land and Air Protection, were all essential in bringing our community to a better understanding of our current situation and to highlight areas of concern. This was necessary so steps can be taken to prioritize problem areas and devise solutions appropriate to the circumstances. The Hornby Island Official Community Plan and the Groundwater Protection Strategy reflect the community's desire to work together in achieving this goal.

The various levels of provincial and local governments, through their initiatives, are indicating they are listening to and want to work with communities to protect the groundwater. They are bringing a varied range of disciplines such as land use planning, environmental and hydrological sciences, sewage treatment technologies and sewage treatment regulations together to formulate guidelines and, perhaps legislation, in an integrated way that is the essence of groundwater itself.

It would seem the timing could not be better for the community of Hornby Island to get ever closer to realizing its objective of having abundant, clean, safe water for our children, ourselves, the other beings we share this beautiful space with, and just for its own sake.

V) Phase III of the Groundwater Protection Pilot Project

A) Terms of Reference

The overall objective of Phase III is to develop an Implementation Plan for the Groundwater Protection Strategy and then to implement this plan. Phase II will also involve the collection of further information necessary to support the intent of the OCP in protecting the groundwater on Hornby Island. The following list of tasks foreseen at this time to successfully complete Phase III include:

- setting an initial meeting with the Groundwater Protection Forum (GPF) and other interested community members to discuss the next steps for Phase III
- GPF to hire a paid Co-ordinator to help keep projects and momentum going. This is necessary in maintaining community interest and motivation, so vital to this process.
- GPF or their representative to put a call of interest for a Co-ordinator position in the local papers.
    - Under the general direction of and in co-operation with the Groundwater Protection Forum, it will be the Co-ordinator's responsibility to:
        - set ongoing meetings with GPF and other interested community members to discuss the next steps for Phase III in greater detail
        - Work together in co-operation with the GPF or committee members to map out the strategy items GPF members or other interested

individuals could take on.

- Determine general tasks, priorities and timelines in consultation with the GPF
- Create a work plan (terms of reference) for each Strategy item with those of priority being addressed first.
- Establish substitutes if one group gets stuck or cannot finish tasks and/or projects (may be difficult to get that kind of commitment from volunteers).
- Prepare budgets (these get fine-tuned as more funding becomes available.
- Liaise with local Partners and government agencies at all levels.
- Research funding options for:
    - a co-ordinator required throughout Phase III (funding would most likely occur in steps)
    - administrative costs
    - Infrastructure including designers of innovative technologies, contractors, and materials costs.
- Collect necessary information, guidelines and application forms and so that next contract can actually begin the application process, particularly for more complex applications. Relatively simple applications may be possibly completed at this stage. Perhaps more could be done depending on initial funding.
- Write letters, arrange and facilitate meetings as needed.
- Arrange and facilitate public information, education and input sessions as needed.
- Complete an interim report (or a final report for this portion of Phase III)

B) Next Steps – Phase III

Whaling Station Bay, should perhaps be the initial focus of the Strategy as it is considered to be the most vulnerable and highly developed of the aquifers on Hornby Island (Hornby Island Aquifer Classification). A detailed technical assessment, as suggested under section E) iii, An Inventory for a Hornby Island Groundwater Management Plan, of the area would be feasible so that priority areas for remediation could be established. Funds could be sought and innovative remedial technologies designed an d/or applied to the selected areas.

Other specific areas on the island that are known to be experiencing potentially serious groundwater and/or sewage problems should also be assessed in tandem with the Whaling Station B ay area.

A note to include in the Hornby Island OCP; a recommendation mentioned in the Final Report: Panel Review of British Columbia's Drinking Water Protection Act is to modify the requirements for minimum distances of septic systems from wells by considering an outcome-based approach (a fixed distance does not consider the geological and soil character istics of the area).

Other aspects of 'Next Steps' to be determined by the Groundwater Protection Forum.

VI) APPENDICES

Appendix A

Government and Island Partners (Phase I) [Modified]

A) Government Agencies

[The names of some agencies have changed and roles oultlined below may have been modified.]

i. **Islands Trust**
Islands Trust is a land-use planning agency operating on a similar level as a regional district, and is administered by the Ministry of Municipal Affairs and Housing. Their role is to provide land-use direction for the Gulf Islands located in the Trust Area. They can also act in an advisory capacity to other government agencies advocating community interests and wishes.

ii. **Ministry of Environment, Lands & Parks (MELP)**
[Ministry of Water, Land and Air Protection (MWLAP)]
The Ministry of Environment, Lands & Parks is responsible for the protection, management and enhancement of the environment in the province. This includes, among other things, water. The Water Management Branch, specifically the Groundwater Section is willing to assist with technical support, such as groundwater hydrogeology research, well water testing, mapping, etc..

iii. **Regional District Comox-Strathcona**
The Regional District of Comox-Strathcona provides a wide variety of services, such as fire protection, waste disposal, parks, recreation, etc. to most of central Vancouver Island and the Nootka region on the mainland. It is a possibility that in the near future it will be taking over health inspections relating to water and wastewater from the Upper Island Central Coast Community Health Services Society. This may bring some flexibility in the way wastewater issues have been managed for Hornby Island. The RDCS would also be able to advise and assist with the development of a Liquid Waste Management Plan if Islanders choose this option.

iv. **Ministry of Municipal Affairs & Housing**
[Ministry of Community, Aboriginal and Women's Services (MCAWS)]
The Ministry of Municipal Affairs and Housing provides direction and guidelines for local governments, such as regional districts and municipalities, in the areas of local elections, property taxes, land-use planning, water and sewer needs, to name a few. The Municipal Engineering Services Branch would be willing to assist with or conduct a water audit on Hornby Island and, generally, provide advice and recommendations based on the Provincial Water Conservation Strategy.

v. **Ministry of Health**
The Ministry of Health provides services in all areas of health in B.C. including environmental and regional health. They set the regulations for sewage systems that have less than 5000 gallons of flow per day per building (MELP [MWLAP] is responsible for flows above this). This applies to Hornby Island. The Upper Island-Central Coast Community Health Services Society currently administers these regulations. They could provide guidance and advice regarding health issues and assist with well testing and testing of alternative systems. They have been working with a local society, GHOSTS

(see below), on a recently constructed wetland.

vi. **Ministry of Agriculture & Food**
The objectives of the Ministry of Agriculture and Food are to support the agriculture and food industry as well as the planning and management of land and water resources to this end. It is also responsible for setting the guidelines for its Composting Regulations. A number of years ago MAF terminated a Reservoir Program for agricultural land whose purpose was to assist farmers in building water catchment and storage systems. Perhaps they could advise in the resurrection of something similar for Hornby Island.

B) Key Community Partners and Resources
The following outline of stewardship groups and businesses represents some of the specialized local knowledge of groundwater, wastewater and environmental protection issues on Hornby Island.

i. Stewardship Groups

a) Water Stewardship Project Committee
Established in 1996 and sponsored by the Heron Rocks Friendship Centre Society. The purpose of project has been to monitor creeks, ditches and beaches for faecal contamination levels, lobby for necessary changes and educate the public. It would seem a natural progression for this committee to take on a groundwater protection-liquid waste management plan in conjunction with representatives from other interested members of the community.

b) Greenhouse Organic Sewage Treatment Society (GHOSTS)
Established in 1994. Their interest is in innovative systems for wastewater management and related research. They are currently involved in monitoring and expanding a constructed wetland they designed at the Tribune Bay Outdoor Education Centre on Hornby Island. Their role at this time would be to provide technical knowledge and advice on alternative and innovative options for waste water management.

c) Conservancy Hornby Island
Established in 1991. Their mandate is to encourage the stewardship, preservation and protection of the human and natural environment of Hornby Island and adjacent waters. Their potential role could be in the protection of groundwater recharge and discharge areas and buffer zones, as well as tree and other vegetation cover that may assist in the catchment process.

d) Hornby Island Forest Management Society
Established as a society in 1996 but has been in existence since 1983. Its purpose is to establish a community managed woodlot on a basis of ecological sustainability and stewardship within the Crown Land parcel on Mount Geoffrey. The role of this society could be to advise on the feasibility of a woodlot-recharge area on the Crown Land and the effective maintenance of tree cover especially related to recharge and discharge areas.

ii. Local Groundwater and Wastewater Related Businesses

a) "Aquarian Systems" - Ed Hoeppner
- innovative systems; solariums; composting toilets; design; greywater systems; installation

b) S.O.S Environmental Services - Richard Ladouceur
- community and onsite treatment and recycling, consulting; design; education/training, approved peat and wetland; management

c) Island Backhoe Services Ltd. - Dave Colley
- septic systems; package treatment plants; installation

d) Gulf Island Well Drillers Ltd. - Keith Stonehouse [No longer in business]
- well drilling; pump installation

e) Ron Emerson, P. Ag.
- soil specialist; consultant; site inspection; septic systems installation

f) Gifco Engineering Ltd. -Giff La Rose, P. Eng.
- consulting engineer; innovative systems; septic systems; wetlands; sand filters

g) Jim Armstrong Hornby Water Services
- sales of rainwater collection systems

h) Tom Rutherford Plumbing
- mechanical pumps; cisterns; rainwater catchment installation

i) Robert McCandless, P. Geo. [Moved]
- geologist; pollution

Appendix B

Advisory Groundwater Protection Committee

Peter Brady – Chairperson
Doug Christie
Cathie Howard
Albini La Pierre
Mary Mackenzie
Marcel Poulin
Klaus Schmid
Eleanor Kneffel – Co-ordinator

Tony Law – Hornby Island Trustee

Appendix C

Grants and Expenses

Islands Trust	$10,100 from their Official Community Plan budget
	$10,009 for SFU Dr. Allen Hydrogeological Study
	$91 to AGPC for out-of-pocket administrative expenses for SFU Dr. Allen Hydrogeological Study (mailout postage, photocopying)
MMA	$12,500 Infrastructure Planning Grants
	$7,500 SFU - Dr. Allen Hydrogeological Study
	$5,000 RRU - Alternative Sewage Treatment
MWLAP	$5,000
	$3,000 to AGPC Co-ordinator
	$2,000 to Islands Trust staff and administrative expenses relating to Phase II

RDCS $1,000 Grant-in Aid
$250 for Uvic student helping with SFU Dr. Allen Hydrogeological Study
$500 AGPC Coordinator
$250 Water Stewardship
$167 to AGPC for out-of-pocket administrative expenses (photocopying, meeting space rent etc.)

Summary of Project Expenses:

SFU Dr. Allen Hydrogeological Study	$17,529
RRU - Alternative Sewage Treatment	$6,250
AGPC Co-ordinator	$3,500
Administrative expenses	$258
UVic Student Liaison	$250

Appendix D

Attendees at the Advisory Groundwater Protection Committee & Off-Island Agencies Meeting

Thursday, April 13, 2000, - 11:00 am (New Horizons, Sollans Rd., Hornby Island)

Present:
Eric Bonham, Director of Engineering Services Ministry of Municipal Affairs & Housing
Kier Cordner, Environmental Health (Courtenay) - Upper Island Central Coast Community Health Care Services Society (UICC CHCSS)
Richard Drake, Citizens Action on Recycling & the Environment (C.A.R.E.)
Graeme Faris, Regional District Comox-Strathcona - Environment & Waterworks
Bill Hodge, Senior Hydrogeologist - Groundwater Section - MELP
Gillian Saxby - Senior Planner, Islands Trust
Rita Zanluk, Sustainable Development Institute & Institute of Health Promotion Research - UBC
Peter Brady - Water Stewardship, substitute
Doug Christie - Chair Water Stewardship
Eleanor Kneffel - Chair AGPC
Albini La Pierre - Chair Forest Management Society
Mary MacKenzie - Water Stewardship
Ed Hoeppner - Greenhouse Organic Sewage Treatment Society (GHOSTS)
Richard Ladouceur
Andrew Carmichael - Conservancy Hornby Island

Tony Law - Hornby Island Trustee
Ron Emerson -- Hornby Island Trustee

Regrets:
Jim Frankish, Sustainable Development Institute & Institute of Health Promotion Research - UBC
Harry Harker, Regional District Comox-Strathcona

Roxanna Mandryk, RDC -S - Director Area K
Al Kohut, Director, - Groundwater Section - MELP
John Rowse, Land Use Specialist - Public Health Protection - Ministry of Health & Seniors
Dwayne Stroh, Environmental Health (Courtenay) - UICCCHCSS
Cliff Turner, Director of the B.C. Groundwater Association

Appendix E

AGENDA

Advisory Groundwater Protection Committee

&

Off-Island Agencies Meeting

Thursday, April 13, 2000, - 11:00 am
New Horizons, Sollans Rd., Hornby Island

1. **Welcome-Introductions**

2. **Questions from Committee to Off-Island Partners:**
   A. If we are establishing a strategy - how can the agencies you represent be involved?
   B. Specify A.
   C. To effectively carry out research on the hydrogeological and liquid waste treatment conditions on the island requires gaining access onto private property by voluntary agreement from homeowners. To those representing government agencies:
      i) can your Ministries give us assurances that they will respect the confidence of the homeowners?
      ii) how meaningful is the data to your agency, particularly unquantifiable data, when there are no names attached and may not be verifiable?
   D. In what way is the work we are doing here on Hornby Island of use to your agencies?
   E. What will your agencies do with the results of this Groundwater Protection Pilot Project?
   F. In what way, do you think, can your respective agency influence the government in following through on the Auditor General's (George Moffitt's) report on groundwater: That the government establish a body specifically designed to protect groundwater, rather than leaving bits and pieces in the hands of several different ministries whose interests lie elsewhere?
   G. What can this community do with respect to F?
   H. It is our understanding that the current government is interested in 'rural

development' and that there is interest to, possibly, open an agency to administer this. What provisions, if any, do you think will be made to protect the groundwater?

3. Report on Yesterday's Union Bay Meeting

4. Future Meetings

The AGPC would like to meet with you again, perhaps September-October, to 'check in', discuss results of studies/research, etc.

5. Adjournment

Appendix F

MORE PARTS OF THE WATER PUZZLE on Hornby Island

Water quality information collected by Hornby Water Stewardship shows that our groundwater resource needs better protection. Fortunately, two projects are planned for this summer in partnership with Royal Roads University and Simon Fraser University which will provide more information. This is, indeed, a unique opportunity to extend the study of groundwater on Hornby. These projects will need the participation of the residents of our Island if they are to be successful.

The first project, by students of Royal Roads, will be directed towards recommendations for **environmentally effective and more affordable residential sewage disposal systems.**

The second project, under the direction of D. Allen from Simon Fraser University, will use **chemical analysis of groundwater** samples to provide a better understanding of recharge areas, underground flow patterns, and salt water intrusion factors.

A **Hornby Island graduate of Environmental Studies** from the University of Victoria will be acting as liaison with property owners.

Royal Roads Environmental Student's Project

In partnership with Hornby Water Stewardship, five Royal Roads University students will undertake a specific class project under the supervision of their professor. They will **research existing and proposed legislation and regulations** which control **sewage disposal technologies currently available** to use. In selected blocks of properties on Hornby Island, students will assess the cost and effectiveness of approved and unproved systems. With your help this will provide a **better understanding of the advantages and the drawbacks of the siting, construction and operation** of the various systems. Lot sizes, in many cases, create great difficulties in locating wells and treatment systems. Selected blocks of properties will be chosen to represent "typical " situations, but the participating landowners, and the lots within each block, **will remain anonymous through a coding system**, with the information retained by Water Stewardship. The results of this project will be another positive step towards developing effective, affordable waste management. If your block is selected, **you will receive detailed information on the project. No property owners will be forced into expensive remedial upgrades.**

Simon Fraser University Earth Sciences Project

Sponsored by Islands Trust and working with The Advisory Groundwater Protection Committee, Dr. Diana Allen, Simon Fraser Earth Sciences Department, will assemble data through well water, stream and wetland samples, on the **geology and the hydrogeology of Hornby Island**. She will identify major aquifers and pathways along fault zones, and **assess groundwater chemistry**. The data base will include mineral calculation results, water chemistry, and a sample location map for wetlands. Environmental factors relating to water quality deterioration, and identification of likely recharge and discharge areas may be defined. **There will be 130 sites chosen**, with the final selection from all applicants made by Dr. Allen. A well log, or detailed information about your well will be useful to Dr. Allen. The legal description of your property will make the mapping quicker. This study will **provide each participant with an extensive chemical analysis** of their well water (not including fecal coliform). **The test would normally cost $100. it will be free to participants in the study.**

These two studies can add substantially to knowledge of groundwater quality, quantity, storage and movement on Hornby. Water Stewardship supports local solutions to water conservation and affordable waste water treatment. We believe these studies can make significant contributions toward wise choices. Remedial action will not be forced upon residents. Renters will be required to contact property owners for permission to be included.

Your participation in these studies will contribute greatly to water protection and health on Hornby Island. Clean water for the future is our common responsibility.

Please return this portion to the Water Projects Box at the Co-op. These projects will be underway shortly. Please respond soon.

Royal Roads Hornby Project Yes ( ) Simon Fraser Earth Sciences Study Yes ( )

Name:_____Telephone:_____

_____

Address:_____

_____

Do you have a well log or other records of your well? Yes ( ) No ( )

Do you have previous chemical analysis from your water? Yes ( ) No ( )

Helpful but not mandatory; Legal Description:_____

Appendix G

Advisory Groundwater Protection Committee

Public Groundwater Meeting

Tuesday, December 12, 2000, Hornby School Library – 7:30 pm

I. Update on Hornby Island Groundwater Protection Activities

1. Outline of who intiated what and what has happened under the Pilot Project to the present point in Phase II – Eleanor Kneffel (5min)
   5 min discussion

2. Brief description of findings of the study by Royal Roads students under the sponsorship of Water Stewardship – Peter Brady for Doug Christie (5 min)
   5 min discussion

3. Outline of purpose and status of Dr. Allen's hydrogeological study -- Eleanor Kneffel (5 min)
   5 min discussion

4. Progress being made on GHOSTS initiatives i.e. wetlands, centralized composting and greywater disposal – Ed Hoeppner (5 min)
   5 min discussion

5. Innovative Systems program and puraflow system being installed on the Island -- Eleanor Kneffel for Richard Ladouceur (5 min)

5 min discussion

BREAK – 10 min

II. **Where the Pilot Project is Headed – Overview & Brief Description of its Components** -- **Peter** Brady

1. Official Community Plan – Tony Law (5 min)
   5 min discussion
2. Public awareness program for better management (operation and management) of waste disposal systems – Ron McMurtrie (5 min)
   5 min discussion
3. The possible development of a community-based liquid waste management plan -- Mary MacKenzie (5 min)
   5 min discussion

Discussion – longer discussion on ideas of most interest

Attendees:

AGPC Committee	Ed Hoeppner	Tony Law	Jerry Pethick
Andrew Carmichael	Cathie Howard	Judith Lawrence	Marcel Poulin
Dale Chase	Thea Jensen	Ron McMurtrie	Ilze Raudzins
Ron Emerson	Jan Kennedy	John Mills	Klaus Schmid
Betty Fairbank	Tom Knott	Margaret Pethick	John Yearsley

APPENDIX H

Attendees at Forum Meetings

Present: (variable)

Peter Brady (AGPC, Chairperson and WS)
Andrew Carmichael (CHI)
Doug Christie (WS)
Ron Emerson (Trustee)
Graeme Faris (RDCS - Environment and Waterworks (E&W))
Ed Hoeppner (GHOSTS)
Cathie Howard (AGPC)
Richard Ladouceur
Albini La Pierre (FMS)
Giff La Rose (GHOSTS)
Tony Law (Trustee)
Judith Lawrence (HIRRA)
Janet Le Blancq (HIRRA - Recycling)
Mary Mackenzie (AGPC and WS)
Ron McMurtrie (GHOSTS)

Roxanna Mandryk (RDCS, Area K Director)
Lee Nichol (RDCS - E & W, Student Intern)
Klaus Schmid (AGPC)
Marcel Poulin (AGPC)

APPENDIX I

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HORNBY ISLAND GROUNDWATER PROTECTION STRATEGY

INTRODUCTION

This Strategy was developed under a Pilot Project undertaken by concerned Hornby Island residents under a joint initiative of the Groundwater Section of the Provincial Government and Islands Trust. It is intended that this Strategy will contribute significantly to the successful completion of groundwater protection strategies for other similar areas in British Columbia.

The quantity and the quality of groundwater on Hornby Island are of paramount importance and yet are of growing concern.

In the absence of natural surface water sources, groundwater is the primary water source with limited supplies provided by cisterns and man made ponds. There are already depletion problems in a number of areas on the Island and yet many approved lots are still to be developed in these same areas. Also, there is a potential for additional development in recharge areas delineated in recent hydrgeological studies and which are the source of supply for only partially developed areas already experiencing groundwater depletion problems. The need for water conservation is apparent.

The need for better protection of groundwater quality also is apparent. From 1996 to 1999 over 800 surface, marine and well water samples were tested under the Water Stewardship Program undertaken by Island volunteers. Almost 80% of streams had fecal coliform counts above background levels and over 20% of the 167 well tested had levels of fecal coliform which exceeded drinking water standards. A study undertaken by a team of Royal Roads students for Water Stewardship demonstrated that groundwater pollution from older and inadequate wastewater treatment systems is already a problem. This situation is made worse by a lack of understanding by residents of the need for action and of what remedial options are available to them. Many seek neither and sometimes install their own solutions or do nothing because of fear that the costs of an approved treatment system may be beyond their means.

Fortunately the current situation can be overcome with the help of recent proposed changes to Health Act Regulations and the opportunity for more local

involvement in their application. These changes provide an opportunity to have a wastewater system approved which is less expensive and an alternative to the standard septic field. The successful future completion of projects designed to test other wastewater treatment systems will no doubt increase these options. The new *Drinking Water Protection Act* and amendments *to* the *Health and Water Acts* also add to the potential for success in achieving the Goal of the Strategy. Also, the ongoing review of the Official Community Plan should result in the policies and supporting Regulations necessary for success.

In addition it has become very apparent that educational programs emphasizing water conservation methods are necessary to reduce water consumption and lead to recycling of effectively treated wastewater.

This Strategy was developed by the Advisory Groundwater Protection Committee in consultation with the concerned Island residents. This Strategy will be recommended as the core of the "implementation" phase of the Pilot Groundwater Protection Project of the Islands Trust and the Provincial Ministry of Environment. Its success will depend on continued local involvement and can only be achieved with the technical, administrative and financial support of the Comox Strathcona Regional District and pertinent agencies of the Province and the Federal Government. The order and timing of different projects and programs under the Strategy will depend totally on the extent of this support and when it is provided.

The purpose of the Strategy is to achieve the following Goal and Objectives.

GOAL - To preserve and protect the quantity and quality of the groundwater resource on Hornby Island through initiatives and programs which achieve the following:

OBJECTIVES

1. - Preservation, and where possible, the enhancement of groundwater recharge quantities through the protection of existing natural wetlands, prudent land clearing and responsible drainage practices.

2. - Preservation and enhancement of available groundwater supplies through the development and use of supplemental storage such as lined dugouts to capture surficial runoff and cisterns to capture rainwater runoff from structures.

3. - Preservation of available groundwater supplies by minimizing water use through responsible indoor and outdoor conservation practices.

4. - Protection of groundwater quality against pollution from land use practices including; application of pesticides, herbicides, and fertilizers, disposal and

leakage of chemicals including fuel and oil , and, concentrations of livestock wastes or garbage, including hazardous wastes.

5. - Protection of groundwater quality from contamination by wastewater from all new development by ensuring that these have approved treatment and dispersal systems.

6. - Reduction and eventual elimination of groundwater contamination from existing development caused by effluent from aging and inadequate wastewater treatment and dispersal systems through a program which fosters the upgrading or replacement of these systems to approved standards.

7. - Prevention of aquifer contamination at well locations through programs which result in proper well drilling, completion and abandonment practices and, prudent management of activities in the vicinity of well heads.

ORGANIZATION AND METHODOLOGY

The strategy will be developed, implemented and modified over time under the direction of a Groundwater Protection Committee. These actions will be undertaken in consultation with the residents and landowners of the Island and in partnership with government agencies. Implementation will be through Island organizations, consultants and regulatory authorities. Administration and coordination will be through the office of a Co-ordinator established under assured government funding.

Support for obtaining funding from senior governments and local taxpayers and for developing and managing local infrastructure systems will be provided by the Regional District. Technical and financial and regulatory support will be provided by the Regional District, Islands Trust and agencies of both senior governments. Enforcement of Bylaws and Regulations will be undertaken in a way that is consistent with the intent of the Official Community Plan so that there is due consideration for programs being developed and implemented under the Strategy when applying discretionary powers under Regulations and Bylaws.

The fundamental approach to Strategy implementation will consist of;

a. Developing, with due regard for privacy, the best possible understanding of the current situation regarding groundwater quantity and quality and the factors threatening further degradation in the absence of this Strategy.

b. Raising public awareness of the need and value in taking the initiative to preserve and protect the resource.

c. Evaluating and compiling information on preservation and protection options available to individuals or groups of neighbours or, involving the use of centralized facilities.

d. Compiling and then providing residents and landowners with the information which will enable them to consider and then take meaningful action with an adequate understanding of their options, the technical and financial support available and what their benefits and costs should be.

e. Advocating and supporting test projects to develop better technologies and information.

f. Advocating enforcement of Bylaws and legislated Regulations by appropriate authorities using permitted discretion in a way which reflects the Strategy.

g. Facilitating the establishment of a permanent performance assurance system which, through ongoing monitoring, ensures all performance based wastewater disposal systems are operated and maintained to meet their performance standards.

h. Monitoring implementation of the Strategy and its effectiveness and ensuring the community is kept informed on progress being made and the extent of beneficial impacts.

PROGRAMS AND PROJECTS

The Objectives will be fulfilled through implementation of a number of programs/projects which are considered appropriate for community leadership or significant support. These will be assisted or coordinated by the Groundwater Protection Committee. The success of these programs/projects will require both public and government support and involvement. The government support/involvement will range from the provision of financial, material, administrative and technical resources to the application of the necessary degree of regulation under pertinent legislation and bylaws while using permitted discretion to support Strategy implementation. The development and operational responsibility for certain systems and a range of technical and administrative support will also be included in this involvement.

The number and type of programs/projects will change over time as feasibility studies are completed, new legislation is passed, new opportunities arise and community values and needs change as the Strategy unfolds.

Programs/Projects will initially include:

1. A program to develop respect for and foster protection of wetlands on both private and public lands. This will include the preparation of a map of natural wetlands on the Island which will then be used to develop a brochure and other tools to be used to increase awareness of the value and location of these wetlands and the need to protect them in order to preserve their contribution to groundwater recharge.

2. A program to preserve and where possible enhance groundwater recharge quantities which could be affected by land use activities. The focus will be on education through the presentation of information explaining how activities such as clearing and drainage changes on private and public lands can enhance or adversely affect groundwater recharge. This will include the preparation of a brochure containing information on how to get technical advice and on what financial incentives may be available.

3. A program to increase water conservation. This will be accomplished by convincing more people of the need and value of water conservation through careful supply management, recycling and wastewater disposal which minimizes or eliminates the use of water. A public information program will be developed and implemented to encourage conservation and then provide information which people need if they are to make this happen.

4. A project to enable approved greywater treatment and dispersal. This would include the continued testing of promising greywater treatment systems until the approval of one or more systems is given by the Ministry of Health.

5. A project to assess the feasibility of a centralized composting facility. This facility would treat combinations of waste including toilet compost, properly treated septic tank sludge, unrecyclable paper products and kitchen and yard organics. The study would investigate siting, facility funding and management alternatives and options for educating those who would use such a facility.

6. A program to assist and expand the use of composting toilets. This program will be based on the results of Projects 4 and 5 above. This program would include the siting, funding, establishment and operation of a centralized composting facility, if viable, and the installation by landowners of approved greywater systems which are monitored for performance thus ensuring their use is limited to this purpose. This program would have an education component which would include a brochure providing information on available composting toilets and greywater treatment systems. This would include features of various products and systems, the associated costs and where information on specific products can be obtained. Guidance on how to proceed with an application for approval will also be included.

7. A project to assess the desirability and feasibility of centralized wastewater treatment facilities for existing subdivisions. The possibility of such a study

would be addressed early in the development of the Strategy. Any pre feasibility study would only be undertaken upon request of from a majority of landowners in a subdivision. The Regional District would be the lead agency for this project including the decisions on further studies, project viability, financial arrangements, project construction, and, operation and maintenance of the works.

8. A program which promotes proper wastewater treatment. This will enable landowners to make informed decisions on installing approved wastewater treatment systems. The program will provide an updated description of technologies suitable for wastewater treatment on Hornby Island and which have been approved by the Ministry of Health. A technical bulletin would be prepared which would describe the approximate cost and physical aspects of each system, siting constraints and operation and maintenance requirements and approximate costs. The types of system would be limited to those which treat wastewater from individual and small neighbouring clusters of residential buildings. This program would also provide information on how and where to get additional technical information and how to proceed in getting approval. The bulletin will be updated periodically and a full understanding of its contents supported by technical information meetings.

9. A program which reduces and eventually eliminates groundwater pollution caused by effluent from failing or inadequate wastewater treatment systems. This will be accomplished by encouraging and supporting landowners in extending the life of, or replacing failed, septic tank and field systems and other inadequate systems. A public awareness program will be developed and initiated to make the public aware of the value in proper septic tank loading and timely pumpout. This will emphasize health, environmental and financial benefits. A technical bulletin will be prepared so owners understand the operation and maintenance required for their particular system. In the case of failed or inadequate systems, landowners will be referred to the information bulletins made available under programs 6 and 8 above. Information/technical meetings will be held as required.

10. A program to reduce and eventually eliminate pollution of aquifers resulting from contaminated water entering groundwater through the well itself or around the well casing. A brochure will be prepared explaining preventative structural measures and how to take these. The brochure also will describe how pollution from land use activities in the vicinity of well heads can be prevented. All community wells will be evaluated and a program developed to eliminate pollution from activities in the area around each well head.

11. A program to prevent contaminated water from entering aquifers through abandoned wells. The groundwater Section, of the Provincial Government will be asked to prepare a brochure on how to seal unused wells. It will advise of the urgent need to seal unused wells and explain how this can be done and

by whom. The brochure will be made available to all landowners. An inventory of known abandoned wells will be prepared using MOEL&P records and local knowledge. Owners of properties containing these wells will be contacted and encouraged to undertake remedial action. Inaction may be followed by a request that measures be taken under the Drinking Water Protection Act.

12. A program to protect aquifers from pollution resulting from improperly constructed wells. The Groundwater Section, MOEL&P will be encouraged to develop and enforce appropriate well construction and completion standards. On site support will be provided where possible through monitoring of siting and use permits. All landowners with new wells will be provided with a copy of the brochure produced under Program 10.

13. A program to prevent the pollution of aquifers caused by land use including household activities such as the application of herbicides, pesticides and fertilizers to yards and gardens and the use, leakage and disposal of chemicals such as household cleaners, garbage and petroleum products. This program will consist of an education program to raise public awareness of the necessity of preventing this type of groundwater pollution and will foster the use of alternative products and practices to make this happen.

14. A program to protect aquifers from pollution caused by inappropriate agricultural practices. This program will promote the pertinent agricultural related policies of the Official Community Plan such as encouraging organic farming while discouraging the use of chemicals and farming methods such as the management of manure in such a way as to cause groundwater contamination from polluted and nutrient enriched recharge waters entering aquifers through underlying soils or through infiltration of surficial runoff. In addition this program will promote use of the Code of Agricultural Practice for Waste Management and related legislation and regulations.

15. A program to measure the effectiveness of Strategy implementation. This will include documentation of the quantity and quality of the groundwater resource, water use and wastewater disposal practices for the island as a whole at the start of Strategy implementation. Subsequent activities would include ongoing measurement and documentation of changes and the preparation of an annual progress "report card" which will be made available to the public. Also, monitoring will be undertaken on a site/area specific basis where it is considered prudent to evaluate the impacts of potentially excessive groundwater withdrawal or waste storage/disposal practices. In cases where such withdrawal involves the transport of water to other properties this monitoring will measure and document the location, timing and the amounts of deliveries made necessary by aquifer depletion.

PRIORITIES AND SCHEDULING

Consultations with the public, community organizations and government officials will determine priorities and the initial levels of financial and technical support. A framework for implementation of the Strategy, which will include scheduling, will then be developed.

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